

NASA
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SUBJECT: Flakes Found in SAEF-2 High Bay during MAP Cleaning

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1.0 REQUEST:

Flakes were found in the SAEF-2 high bay during cleaning of the Microwave Anisotropy Probe (MAP) spacecraft. The flakes were collected in a glass tube and submitted for analysis. Identification of the flakes was requested.

2.0 PROCEDURE:

The flakes were examined using optical microscopy (OM) and analyzed using scanning electron microscopy (SEM) with x-ray energy dispersive spectroscopy (EDS). EDS is used to provide a qualitative and semi-quantitative analysis for all elements in the periodic table above beryllium (4). The flakes were also analyzed using Fourier-transform infrared spectroscopy (FT-IR).

3.0 RESULTS:

3.1 Optical microscopy revealed that the flakes were off-white and very crumbly.

3.2 EDS analysis of the flakes showed high aluminum and oxygen, with traces of carbon, chromium, iron, sodium, magnesium, silicon, phosphorus, sulfur, and calcium. Some particles showed a minor indication (slightly higher than a trace) of sulfur. These flakes were likely aluminum oxide compounds.

3.3 Analysis of the flakes by FT-IR did not give conclusive identification.

EQUIPMENT: Cambridge Stereoscan 200 Scanning Electron Microscope
Oxford Link ISIS Energy Dispersive Spectrometer, MSL cal. 0135
Bio-Rad 575C Fourier-Transform Infrared Spectrometer, MSL cal. 0180

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